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ABSTRACT

This paper outlines Japanese children's preconceptions to communication media. In a study, the function of media was divided into two categories--one is an "informational receiving" function and the other is an "informational sending" function. Preconception (consciousness about degree of liking and level of difficulty) of media was investigated in Japanese students. The receiving media activities are as follows: reading books, listening to people, watching TV or videos, and using computers and the Internet. Findings suggest the following three conclusions as a result of researching 649 elementary and junior high school students: (1) traditional media, writing and reading, in regards to both sending and receiving functions, are liked and are not difficult, but new media, the Internet or computers, are not liked for sending or receiving by students and are difficult; (2) school children with experience in using the Internet like the Internet and computing and do not find them difficult; and (3) in regards to both sending and receiving, students who like a particular type of media do not find it difficult. (Includes 11 tables and 3 figures. Contains 13 references.) (NKA)

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A Study of Children's Preconceptions to Communication Media

by

Takashi Ikuta and Yasushi Gotoh

Paper presented at the British Educational Research Association Annual Conference 2001
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A Study of children's preconceptions to communication media

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Summary

This paper outlines Japanese children's preconceptions to communication media. We have divided the function of media into two categories. One is an "informational receiving" function and the other is an "informational sending" function. We investigated preconception (consciousness about degree of liking and level of difficulty) of media in Japanese students. The receiving media activities are as follows, reading books, listening to people, watching TV or videos, and using computers and the internet. The sending media activities are as follows, writing reports, talking to classmates, showing photographs and videos and using computers and the internet.

We reached the following three conclusions as a result of researching 649 elementary and junior high school students. Firstly, traditional media, writing and reading, in regards to both sending and receiving functions, are liked and are not difficult. But new media, the internet or computers, are not liked for sending or receiving by students and are difficult. Secondly, children of schools with experience in using the internet like the internet and computing and do not find them difficult. Thirdly, in regards to both sending and receiving, students who like a particular type of media do not find it difficult. In regards to computers, students who like computers for receiving also like it for sending. Moreover, a child who feels computing is difficult for receiving also thinks that it is difficult for sending.

Introduction

If one looks at it historically, the form of communication has changed from communicating solely by sound to communicating by characters, which coincides with the development of printing technology. School education has developed by improving literacy to correspond to this kind of communication. The functions of literacy can be bifurcated. One is a receiving function (decoding function) and the other is a sending function (coding function). We can fully utilize these two functions in regards to traditional literacy, for example, character literacy.

Recently, the style of communication has been changing with the rapid spread of Information Communication Technologies to a network style. Schools should also change their literacy training to one that suits a style which uses the internet. Compared to character and sound communication, the internet and multimedia style of communication is not as clear when it comes to sending and receiving information.

Today the internet and multimedia are spreading all over Japan. How do students perceive this new style of communication whilst it is still in a stage of expansion? The preconception of media is determined by being aware of the degree to which one likes the media and the level of difficulty of the media.

Krendle (1986) researched the preconception of four media activities, watching TV, using computers, reading books and writing reports. Saga (1988, 1993) researched and added "hearing teacher's talk" to this. In his findings, Saga concluded that the more one likes a particular media style, the more difficult it becomes, yet Saga discovered ambivalence in regards to computers. Computers were liked in spite of being difficult. Information receiving and information sending were intermingled in both Krendle and Saga.

In order to expand this research, Gotoh & Ikuta 1997, and Gotoh & Ikuta 1999, investigated preconceptions of media by separating information receiving and sending functions.

In regards to receiving information, Gotoh and Ikuta recognized a certain level of ambivalence between the degree of enjoyment and level of difficulty. Moreover, in regards to sending information, the level of difficulty of the media activity was hard to distinguish.

However, this research was carried out with a limited number of subjects and it was shown to be necessary to investigate this topic using substantially more subjects.

Moreover, when this research was conducted, the spread of the internet in Japan had not progressed to the level it is today. In addition, the primary form of use of the internet is also changing at present from an information receiving function to a sending function.

Purpose

In response to the above, the purpose of this research is noted by the following three points.

1. To identify how receiving / sending media is perceived by Japanese students.
2. To identify the difference in preconceptions of receiving / sending media by using subjects with various experience in Internet use.
3. To clarify the structure of preconceptions of receiving / sending media.

Method

Sample and investigation time

A total of 649 people were subjects in the research (252 Japanese junior high school students and 397 Japanese elementary school students). The research was conducted in 1999.

In order to compare the various levels of exposure to the internet, two schools, one with internet access and one without, were specifically selected from this sample. These schools were more closely investigated. The school with the internet is “H” Elementary School (98 students), in which the internet had been introduced half a year before this research was conducted, and where the use of the internet in lessons is quite aggressive. The non-internet school is “T” Elementary School (94 students), where the internet and computers had not been introduced at the commencement of this research.

Investigation of Preconceptions

The media activities used in this research are shown in Table 1.

For both the receiving and sending functions, preconceptions were investigated with the `one pair` comparison method utilizing two dimensions (degree of enjoyment and level of difficulty) and four media activities.

The receiving media activities are as follows, reading books, listening to someone, watching TV or videos, and using computers and the internet.

The sending media activities were as follows, writing reports, talking to classmates, showing photographs and videos and using computers and the internet.

Eight pair combinations using four media activities were shown, and were chosen by each pair.

The questions were as follows.

- When researching, which activities were your favorites? Degree of enjoyment of information receiving
- When researching, which activities were difficult? (Level of difficulty of information receiving)
- When synthesizing and presenting information, which activities were your favorites? (Degree of enjoyment of information sending)
- When synthesizing and presenting information, which activities were difficult? (Level of difficulty of information sending)

From the obtained data, the relationships between the different media activities were computed by the method of 'paired comparisons' using Thurstone case V.

Moreover, the correlation between the degree of liking an activity and the level of difficulty of that activity was investigated based on the number of times subjects chose a particular media activity.

Furthermore, the correlation between receiving and sending was investigated based on the number of times subjects chose a particular media activity.

The structure of preconception was examined from these correlations.

Table 1. Media activity of receiving and sending

Symbol	Media activity of information receiving	Media activity of information sending
Character	Reading books	Writing reports
Image	Watching TV or videos	Showing photographs and videos
Sound	Listening to someone	Talking to classmates
Multi-symbol	Using computers and the internet	Using computers and the internet

Result

Overall Tendencies

Distance during media activity

Fig. 1 shows the relationship between media activities in regards to the whole research sample. In regards to favorite activities, media activities that were liked the least are located at the starting point. The further the activities are from the starting point, the more they are liked.

In regards to the level of difficulty, the easiest media activity is located at the starting point. The further the activities are from the starting point, the more difficult they are.

In regards to receiving media activities, books were both liked and found to be a little difficult. Television was not liked so much and was not so difficult.

The activity of talking was liked and was not difficult. Computing was not liked and was considered difficult. In regards to sending media activities, compositions were liked and were not felt to be difficult. Photographs were liked and were not difficult. The activity of talking was not liked and was found to be difficult. Computing was not liked and was difficult.

Media activities using characters were liked in regards to both receiving and sending, and were not thought of as difficult. Media activities using images were not liked so much in regards to receiving, and were not considered difficult. When it came to sending, they were liked and were not considered difficult.

Media activities using sound were liked in regards to receiving and were not viewed as difficult. However, in regards to sending, the activities were not liked and were difficult.

Media activities using computers were not liked in regards to receiving or sending, and were found to be difficult.

Moreover, the following can be said as an overall trend. In regards to the level of difficulty of sending, the distance from the starting point is short. From this result, it is suggested that it is hard to distinguish the level of difficulty of media activities that send information.

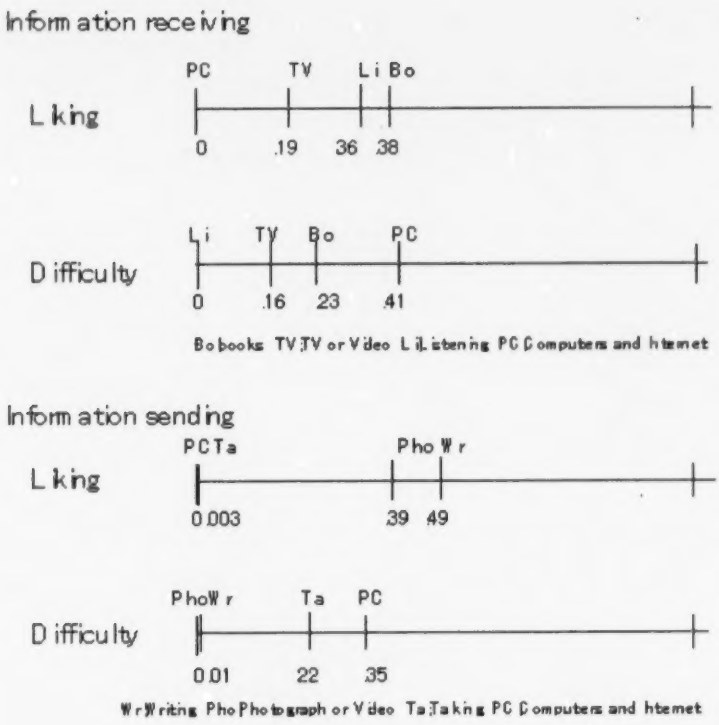

Figure 1. Distance during media activity

Structure of preconceptions

Table 2 shows the correlation between the degree of liking and the level of difficulty of receiving information.

A correlation coefficient of more than -.5 is observed in every situation.

This shows that students who like the receiving media activity found it not to be difficult.

Table 3 shows the correlation of the degree of enjoyment and the level of difficulty of sending information. A correlation coefficient of more than -.6 is observed in every situation. This shows that the students who enjoy the sending media activity found it not to be difficult.

Next, the correlation of receiving and sending was considered. The correlation was developed using the same media.

Table 4 shows the correlation of receiving and sending in regards to how much one likes an activity. The correlation coefficient is .2 and is not high.

Table 5 shows the correlation between receiving and sending in regards to the level of difficulty. Similarly, a clear correlation is not apparent.

But as an exception, it is in regards to computing activities where a remarkable correlation can be seen.

The correlation coefficient between receiving and sending in regards to how much one likes a particular activity is .553. The correlation coefficient between receiving and sending in regards to the level of difficulty is .481.

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There is a clear correlation between receiving and sending in regards to computing. That is, students who like computers for receiving media activities also like computers for sending media activities. Students who think computing for receiving media activities to be difficult also think computing for sending media activities are difficult as well.

Table 2. Correlation of enjoyment and difficulty

(Information receiving)

	Correlation coefficient
Reading books	-.533*
Watching TV or videos	-.570*
Listening to someone	-.548*
Using computers and the internet	-.563*

-Signif.LE..05 **-Signif. LE..01 (2-tailed)

Table 3. Correlation of enjoyment and difficulty

(Information sending)

	Correlation coefficient
Writing reports	-.661*
Showing photographs and videos	-.663*
Talking to classmates	-.623*
Using computers and the internet	-.629*

-Signif.LE..05 **-Signif. LE..01 (2-tailed)

Table 4. Correlation of receiving and sending

(Degree of enjoyment)

	Correlation coefficient
Reading books/ Writing reports	.238*
Watching TV or Videos/ Showing photographs and videos	.267*
Listening to someone/ Talking to classmates	.240*
Using computers and the internet/ Using computers and the internet	.553*

-Signif.LE..05 **-Signif. LE..01 (2-tailed)

Table 5. Correlation of receiving and sending

(Level of difficulty)

	Correlation coefficient
Reading books/ Writing reports	.227*
Watching TV or videos/ Showing photographs and videos	.186*
Listening to someone/ Talking to classmates	.194*
Using computers and the internet/ Using computers and the internet	.481*

-Signif.LE..05 **-Signif. LE..01 (2-tailed)

Comparison of exposure levels to the internet

Next, the results comparing experience in computing is detailed.

Fig. 2 shows the relationships of media activities in a school which does not utilize computers or the internet. In regards to information receiving, books are liked and are somewhat difficult. Television is liked and is not so difficult. Talking is liked and is not difficult. Computing is not liked and is very difficult.

In regards to information sending, compositions are liked very much and are not difficult. Photographs are liked very much and are not difficult. Talking is liked and is not difficult. Computing is not liked and is perceived to be very difficult.

Fig. 3 shows the relationships of media activities of a school which uses computers and the internet. In regards to information receiving, the results are as follows.

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Books are liked and are somewhat difficult. Television is liked a little and is not difficult. Talking is not liked and is difficult. Computers are liked and are not so difficult.

In regards to information sending, the results are as follows. Compositions are liked and are not difficult. Talking is not liked and is difficult. Computing is liked and is perceived not to be so difficult. In regards to the level of difficulty with sending activities, the distance between the activities is minimal.

Comparing the wired school with the non-wired school, a remarkable difference can be seen when looking at computing. As far as students of the non-wired school are concerned, computing is not liked and is difficult. On the other hand, students from the wired school like computing and do not find it difficult. This tendency is common in both receiving and sending.

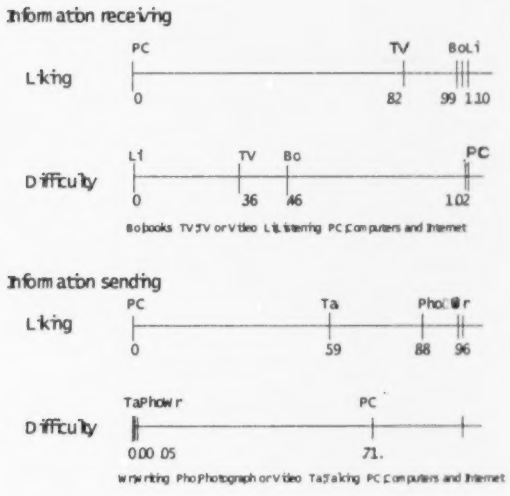

Figure 2. Distance during media activity
(school without computers or internet access)

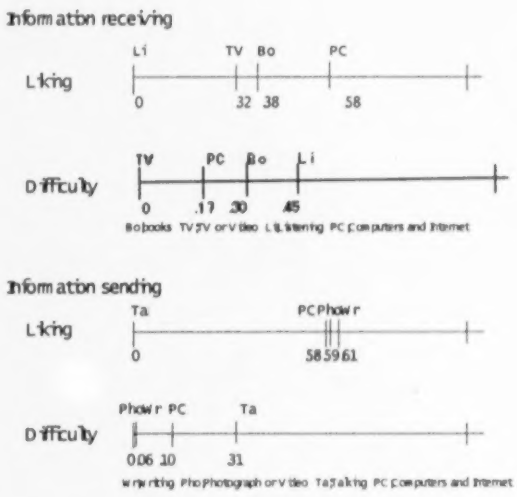

Figure 3. Distance during media activity
(school with computers and internet access)

Comparison of selection frequency of a particular type of media activity

In order to compare the preconceptions of students from wired and non-wired schools, the number of times each activity was selected, was analyzed.

The highest frequency of selection was 3 times. The minimum was 0 times.

Table 6 shows the degree of enjoyment. In regards to the degree of enjoyment, the more an activity is selected means that it is enjoyed by more students.

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Table 7 shows the level of difficulty. It is shown that the more difficult an activity is the greater the frequency of selection. A difference is not seen in media activities using characters. The same is said of media activities using images. Yet, there is a significant difference between the wired school and non-wired school in media activities using computing. In the wired school, computers are liked and are not perceived to be difficult. On the other hand, in the non-wired school, they are not liked and are perceived to be difficult. Moreover, there is a significant difference between the school with internet access and the school without in media activities using sound. In the non-wired school, sound activities are liked and are perceived not to be difficult. On the other hand, in the wired school, these activities are not liked and are perceived to be difficult.

Table 6. Frequency of liked activities

	Media	Experience	0 times	1 time	2 times	3 times
Information receiving	Books	Exp.	18.9%	25.5%	34.9%	20.8%
		Inexp.	12.7%	25.5%	31.4%	30.4%
	TV Videos	Exp.	17.9%	35.8%	25.5%	20.8%
		Inexp.	8.8%	41.2%	34.3%	15.7%
	Listening	Exp.	41.5%	30.2%	17.9%	10.4%
		Inexp.	6.9%	25.5%	35.5%	32.4%
	PC	Exp.	7.5%	29.2%	26.4%	36.8%
		Inexp.	74.5%	8.8%	10.8%	5.9%
Information sending	Writing	Exp.	10.4%	35.8%	28.3%	25.5%
		Inexp.	10.8%	19.6%	37.3%	32.4%
	Photos Videos	Exp.	13.2%	29.2%	33.0%	24.5%
		Inexp.	10.8%	32.4%	22.5%	34.3%
	Talking	Exp.	50.0%	25.5%	18.9%	5.7%
		Inexp.	21.6%	34.3%	27.5%	16.7%
	PC	Exp.	18.9%	17.0%	36.8%	27.4%
		Inexp.	62.7%	17.6%	13.7%	5.9%

Table 7. Frequency of difficult activities

	Media	Experience	0 times	1 time	2 times	3 times
Information receiving	Books	Exp.	17.0%	29.2%	32.1%	21.7%
		Inexp.	22.5%	22.5%	38.2%	13.7%
	TV Videos	Exp.	34.0%	29.2%	29.2%	7.5%
		Inexp.	23.5%	34.3%	32.4%	9.8%
	Listening	Exp.	16.0%	24.5%	20.8%	38.7%
		Inexp.	48.0%	32.4%	13.7%	5.9%
	PC	Exp.	32.1%	23.6%	23.6%	20.8%
		Inexp.	9.8%	16.7%	15.7%	57.8%
Information sending	Writing	Exp.	27.4%	28.3%	32.1%	12.3%
		Inexp.	29.4%	32.4%	26.5%	11.8%
	Photos Videos	Exp.	24.5%	32.1%	29.2%	14.2%
		Inexp.	33.3%	23.5%	36.3%	6.9%
	Talking	Exp.	17.9%	16.0%	30.2%	35.8%
		Inexp.	30.4%	39.2%	16.7%	13.7%
	PC	Exp.	27.4%	28.3%	19.8%	24.5%
		Inexp.	10.8%	16.7%	16.7%	55.9%

Exp.; Experienced school Inexp.; Inexperienced school Exp.; Experienced school Inexp.; Inexperienced school

Comparison of the structures of preconceptions

Table 8 shows the correlation between the degree of enjoyment and level of difficulty in regards to receiving information. The degree of enjoyment and level of difficulty are correlated clearly.

In regards to the wired school, the tendency is remarkable when looking at activities using books and computers.

Table 9 shows the correlation between the degree of liking an activity and the level of difficulty in regards to sending information. The degree of enjoyment and level of difficulty are clearly correlated similar to the informational receiving situation.

Table 10 shows the correlation between receiving and sending activities in regards to the degree of enjoyment. A weak correlation is seen in information receiving and sending.

Table 11 shows the correlation between receiving and sending in regards to the level of difficulty. Similarly, a clear correlation is not seen.

However, in regards to computers, a remarkable correlation can be seen. Students who like computers for receiving activities also like them for sending activities. Moreover, students who think computers are difficult for receiving information also think that it is difficult for sending information. This result is common in both schools with or without computing/internet capabilities.

Table 8. Correlation between degree of enjoyment and level of difficulty

(Information receiving)

	Non-wired school	Wired school
Reading books	-.463**	-.717**
Watching TV or videos	-.521**	-.469**
Listening to someone	-.448**	-.511**
Using computers and the internet	-.376**	-.667**

-Signif.LE..05 **-Signif. LE..01 (2-tailed)

Table 9. Correlation between degree of enjoyment and the level of difficulty

(Information sending)

	Non-wired school	Wired school
Writing reports	-.545**	-.671**
Showing photographs and videos	-.693**	-.737**
Talking to classmates	-.522**	-.646**
Using computers and the internet	-.512**	-.655**

-Signif.LE..05 **-Signif. LE..01 (2-tailed)

Table 10. Correlation of receiving and sending (degree of liking)

	Non-wired school	Wired school
Reading books/ Writing reports	.106	.344**
Watching TV or videos/ Showing photographs and videos	.205*	.170
Listening to someone/ Talking to classmates	.315*	.205*
Using computers and the internet/ Using computers and the internet	.561*	.544*

-Signif.LE..05 **-Signif. LE..01 (2-tailed)

Table 11. Correlation of receiving and sending

(Level of difficulty)

	Non-wired school	Wired school
Reading books/ Writing reports	.185	.208*
Watching TV or videos/ Showing photographs and videos	.184	.155
Listening to someone/ Talking to classmates	.171	.104
Using computers and the internet/Using computers and the internet	.560*	.416**

-Signif.LE..05 **-Signif. LE..01 (2-tailed)

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Consideration

The overall tendencies of preconceptions

We will summarize the preconceptions of Japanese elementary and junior high school students.

First, character activities, which are traditional media types, are described. Character activities are liked in both receiving and sending, and are perceived not to be so difficult.

Next, regarding sound activities, sound activities are liked for receiving and are not difficult. However, in the case of sending activities, they are not liked and are difficult.

Possibly this is influenced by the style of traditional classroom instruction in Japan. Japanese students are supposed to listen to their teachers attentively. However, expressing opinions is not encouraged, thereby making children uncomfortable sending information in such a context.

Regarding schools without computing experience for most subjects, in receiving as well as with sending activities, computers are not liked and are perceived to be difficult. Ambivalence toward the degree of enjoyment or level of difficulty was not seen in this research. This research was conducted in 1999 and up to that time, the computer itself was considered novel in Japan. Because of this relative unfamiliarity with computers, it is most likely that computing was not considered appealing and the students thought it to be difficult.

Comparison of preconceptions based on exposure to the internet

In the school without internet access, in both information receiving and information sending, computing was not liked and was perceived to be difficult. On the other hand, in the wired school, in both information receiving and information sending, computing was liked and perceived not to be difficult. Ambivalence toward computing was not apparent for this reason.

At the school with internet access, lessons were designed appropriate to the level of the students. Since the lessons were not too complicated for the students, any ambivalence toward the medium was negated. However, there still were a few students who perceived computing to be difficult. From this, it cannot be confirmed that all students who have a greater access to computers do not find the activities difficult.

Moreover, it was suggested that it is hard to distinguish the level of difficulty of the media activities which send information. This is not related to the experience of computer use.

Structures of preconceptions

In regards to all the media activities, a clear relationship that activities being perceived as not difficult were also liked was seen. This relationship is common to both information receiving and information sending media activities. On the other hand, when the same media type was used, a correlation between receiving and sending was not so clear. Only computing activities were seen to have a clear correlation. In regards to the degree of enjoyment, the relationship that "students who like computing for receiving also like it for sending" was seen.

In regards to the level of difficulty, the relationship that students who perceive computing to be difficult for receiving also found it difficult for sending was seen. It was suggested that this tendency is also unrelated to the level of exposure to computers.

Finally, we would like to describe a plan for the future.
For this research, the school with internet access was quite positive about the introduction of Information Communication Technology, and lessons which utilized the internet and multimedia more effectively had been developed.
The internet will be introduced into all public schools starting in April 2002 and many schools (unlike H Elementary School) will not have accumulated any prior experience using the internet. The preconceptions of the students, faculty, and administration in these schools towards the internet need to be more closely investigated.

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